Introduction – Patients Need Certainty

For patients, each diagnosis is an emotional struggle

Yearly 14M new cancer cases
Survival doubled since 1970\(^1\)

\(^1\) https://www.cancerresearchuk.org/health-professional/cancer-statistics/worldwide-cancer/incidence
Introduction – Growing Medical Knowledge

Increasingly difficult for professionals to keep up

- **1950**: 50 years
- **1980**: 7 years
- **2010**: 3.5 years

By 2020, medical knowledge will double every 0.2 years or in just 73 days

Source: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116346/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116346/)
Introduction – Layers Of Complexity In Medicine

Layers of interdependent data add complexity at various levels
Introduction – Changes In Healthcare Environment

Healthcare undergoing rapid and fundamental change

- Increased understanding of disease biology
- More educated and empowered patients
- Novel technologies and data sources entering research as well as clinic
- Regulatory environment evolving for digital and improved data privacy
- Partnerships forming between non-traditional players
- Global demand for outcome-driven, value-based healthcare
Roche Group – What Makes Us Different
Unique combination of assets in ONE Roche

Roche uniquely positioned:
- Pharma & Diagnostics under one roof
- Excellence in medicine and biology
- Leading portfolio of therapies
- Reputation as a trusted pioneer
- Global scale and reach
- Strong partnerships
Roche Group – Personalised Healthcare Opportunity

Leverage data to shift focus towards truly individualised patient care

**PAST**
Blockbuster drugs
One medication for broad categories of patients with a disease

**PRESENT**
Companion Diagnostics
Advanced diagnostics & targeted medicines for specific groups of people

**FUTURE**
Personalized healthcare
Individualized treatment & disease management targeted to specific patient
Roche Diagnostics – Clinical Decision Support Opportunity

Clinical Decision Support at the center of care continuum
Diagnostics Information Solutions (DIS) – Strategy Overview

**Focus on clinical decision support**

**Our Vision**
Become **leading provider** of data-driven and value-based **clinical decision support solutions** for healthcare **providers** and **patients**

**Our Objectives**
- Improve patient outcomes
- Empower our customers
- Establish CDS business

**What We Do**
- Oncology
- Infectious Disease

**How We Win**
- NAVIFY portfolio
- Customer success
- Ecosystem & partnerships
- Data & analytics capabilities

**Culture, Purpose, Impact**
DIS Strategy – Clinical Decision Support Framework
*Enabled by R&D and supporting value-based care models*

**New IVD technologies & next-gen CDS**

**Smarter, more efficient R&D**

**Data & Analytics**

**New hypotheses & experiments**

**Patient outcomes**

**More confident clinical decisions**

**Documentation & standardization of quality & cost of care**

**Value-based care / Disease Management**

**Population analytics & managed care**
DIS Strategy – Clinical Decision Support Elements

Enabled by activities in translational science, data and with payors

Rapid translation of new discoveries & capability development

Informed by Science

Clinical Decision Support

Supporting value-based care

Aggregated, longitudinal data drives high-quality, differentiated CDS

Driven by Data

Incentivizing provider adoption of CDS through payor influence & provider efficiency

Better Patient Care
NAVIFY Ecosystem – Decision Support Portfolio Overview
Platform with workflow products, apps and value-added services

1 NAVIFY Platform, A scalable, secure, and flexible platform enabling DIA teams to collaborate and deliver innovative and compliant cloud-based decision support products
2 Workflow Products, e.g. Tumor Board, Oncojourney, Mutation Profiler, Translational Research
3 Decision Support Apps, e.g. Literature Search, Clinical Trial Matching, Guidelines, Immunoprofiling, IRIS Algorithms etc
4 Customer valued, data-enabled analytics services. Strong feedback loop to data aggregation and Decision Support Apps.
5 Ecosystem of 3rd party CDS App providers and Service providers forming around NAVIFY Platform and Workflows
Supporting oncology care teams to review, collaborate, and align on treatment decisions for patients.

A comprehensive dashboard for cancer care teams - integrates all the disparate pieces of clinical data from multiple specialists into one useful dashboard built for collaboration.
NAVIFY Ecosystem – NAVIFY Tumor Board Workflow Study

Workflow benefits for oncology care teams

NAVIFY Tumor Board improves workflow efficiency with shorter preparation time particularly for oncologists.¹

¹ http://www.jpathinformatics.org/article.asp?issn=2153-3539;year=2018;volume=9;issue=1;spage=26;epage=26;aulast=krupinski

Workflow image source: NAVIFY Tumor Board White Papers on https://www.navify.com/tumorboard/
**PATIENT HISTORY**

**HISTORY OF PRESENT ILLNESS**

46-year-old post-menopausal woman who initially presented to her family physician in Nov 2018 with a right breast lump. Mammogram (4th Dec 2018) showed an irregular speculated 2.5mm density in the right upper outer quadrant. Core Needle Biopsy (10th Dec 2018) revealed a poorly differentiated (grade 3) invasive ductal carcinoma. Biomarkers show HER2 negative, ER negative, PR negative; CK5/6 negative.

**PAST MEDICAL HISTORY**

- Smoking status: 10 cigarettes per day (started in 2010)
- Alcohol: 20 units per week
- Consumption
- Ovarian Cancer: Left ovary low-grade serous carcinoma (2010), Treatment was TAHBSO (6 Sep 2010), No recurrence

**PHYSICAL EXAMINATION**

- Blood Pressure: 07 Dec 2018 114/76 mmHg
- Heart Rate: 07 Dec 2018 73 bpm
- Respiratory Rate: 07 Dec 2018 14 per/min
- Temperature: 07 Dec 2018 36.8 Celsius
- Height: 07 Dec 2018 167 cm
- Weight: 07 Dec 2018 75 kg
- BMI: 07 Dec 2018 26.9 kg per sq m
- General Observations: 07 Dec 2018 Fit & healthy; Anxious
- Breast Examination: 07 Dec 2018 Lump in right breast upper outer quadrant (mobile, no tenderness); No overlying skin changes; No LN in Axilla
- Respiratory Examination: 07 Dec 2018 Normal - Good air entry bilateral
- Cardiovascular Examination: 07 Dec 2018 Normal - HS II w/o added sounds
- Abdominal Examination: 07 Dec 2018 Soft & non-tender with normal bowel

**SOCIAL HISTORY**

- DATE OF BIRTH: 17 Mar 1974
- MARITAL STATUS: Married
- CHILDREN: 1
- CONTACT: Mary Johnson, Mother +1 322 740632

**MEDICATIONS**

- Citalopram (10mg; OM, PO)
- Paracetamol (1g; QDS, PO)
- Multi-vitamin tablet (1 per day; OM, PO)

**ALLERGIES**

- Penicillin, Peanuts

**CARE TEAM**

Dr. Ana Smith, Dr. Luisa Chen

**TIMELINE**

**All events**

- Multidisciplinary: 25 May 2019

**Past events**

- Molecular Profile report: 01 Apr 2019
- Radiation therapy: 05 Mar 2019
- Radiation to the chest wall and right axilla
- Ultrasound: 29 Dec 2018
- Mammogram: 29 Dec 2018
- Surgery: 29 Dec 2018
- MRI Guided Wire Localization, Right Lymphatic with Right Axillary Sentinel Lymph Node
- Breast tumor board: 21 Dec 2018
NAVIFY Ecosystem – Oncology Workflow
Comprehensive coverage of diagnostic and clinical workflows

Diagnostics Lab
Staining, digital pathology, algorithms, multiplexing, automated analysis

Clinical image analysis algorithms:
- HER2
- ER
- PR
- PD-L1
- Multiplex

Clinical annotation interpretation reporting*

Hospital
multidisciplinary care teams / tumor boards / clinicians / CDS

1 nucleic acid / 2 CAIR: Clinical Annotation Interpretation & Reporting / 3 Clinical Decision Support / 4 Electronic Medical Records
* In development
NAVIFY Ecosystem – Portfolio Evolution

Continuously adding functionalities to expand value

2018
Single setting, single disease area
Workflow products & decision support apps
e.g. NAVIFY Tumor Board + NAVIFY Clinical Trial Match app + NAVIFY Publication Search app

2019
Multiple settings, single disease area
Disease-specific solutions
e.g. Clinical Oncology Solution including multiple Workflows + clinical decision support apps

Beyond
Decision support ecosystem spanning multiple disease areas and settings
Comprehensive decision support portfolio
e.g. NAVIFY ecosystem including 3rd party apps

Approx. 150 deployments (incl. evaluations, manual / integrated version, clinical trial sites)
Commercial – Market Opportunity

Worldwide market opportunity for CDS growing rapidly

**Total Health IT market**  ~$26B

Source: Adapted from DeciBio CDSS Market Landscape Mar 2017

**Total CDS Market**  $1.6B (2018) growing to $2.9B (2023)
Clinical Decision Support (CDS) Market

**Traditional and non-traditional vendors leveraging respective capabilities**

**Health IT**
- **Market incumbents** with large install-base. Incremental improvements in CDS. Partner or acquire for more complex functionality

**MedTech**
- **Tangential players** with large install-base of hospital instruments. Upsell existing customers with integrated value-added solutions

**Technology**
- **New entrants** leveraging deep capabilities in technology, AI, hardware, and user experience.

**Startups**
- **Small startups & specialty providers** offering data, niche solutions, or broad menu of apps. Innovative, agile, but lack scale

**Opportunities**
- Comprehensive, integrated portfolio backed by industry expertise
- Non-competitive & R&D collabos
- Equity investments (e.g. Flatiron)
- Ecosystem partnering

“Roche, GE to Develop Integrated Digital Diagnostics for Oncology, Critical Care Treatment”
Commercial – SaaS Business Model

*Speed and scale: create sockets first, revenue follows*

To get to high customer lifetime value and recurring revenue streams

- R&D and M&D investment
- Landgrab
- Farming

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**Foundational Experiment**

**Speed & Scale**

**Increase share of wallet**

**Industrialisation/Profit optimisation**

*Important to be there before all others*

*Customer success*

*Harvest & re-invest*
Collaboration – GE Healthcare Strategic Partnership
Co-develop and co-market integrated digital diagnostic software products

**Exclusive strategic partnership**
Vendor-agnostic software products in Clinical Oncology (Roche lead) and Acute Care (GEHC lead)

**Benefits / Synergies**
Speed, accuracy and confidence through clinical decision support.
Early diagnosis, intervention and individualized treatment.

**In-vitro diagnostics data**
Biomarkers
Tissue pathology
Genomics and sequencing

**In-vivo diagnostics data**
Medical imaging
Patient monitoring
Collaboration – Accenture Integration Partnership
Connecting disparate clinical information to improve decision making

Exclusive strategic partnership

Decision support solutions
Roche
NAVIFY Platform

Connecting hospitals to NAVIFY platform at scale

Benefits / Synergies
Integration of NAVIFY portfolio into hospitals’ IT infrastructure.

Healthcare providers systems
accenture
Data integration services
Automation of digital backbone
Data standards / formats
Roche uniquely positioned to help navigate increasing complexity in healthcare and deliver on promise of personalised healthcare.

Delivering clinical decision support solutions informed by science and driven by data with the NAVIFY Decision Support Portfolio.

Entering new market to improve clinical workflow efficiency & eventually quality through strong partnerships that help build a digital ecosystem.
Doing now what patients need next